Symons's Meteorological Magazine.

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EDITORIAL.

That the present number of *Symons's Meteorological Magazine* appears without the familiar name of Hugh Robert Mill upon its cover will, we are sure, be a source of deep regret to our readers. For nearly twenty years Dr. Mill has impressed his stimulating personality on this magazine which was brought into being more than half a century ago by the late Mr. G. J. Symons, and which has since his death, in 1900, helped to keep his memory green.

Dr. Mill's nearly twenty years of directorship of the British Rainfall Organization has formed a fitting sequel to the forty years of single-minded and persevering industry by which Mr. Symons had built up a scientific instrument unique of its kind. The great ability and boundless energy of the founder were expended principally upon the work of organization and administration in which his genius chiefly lay. Upon the material which he accumulated Dr. Mill brought to bear a deep scientific insight, combined with that rare faculty for clear demonstration which imparted a peculiar charm to his work. The key to the clearer understanding of rainfall distribution, and the factors which govern it, has been the use of cartographical methods, and a study of the volumes of *British Rainfall* from 1901 onwards in comparison with those of earlier years shows how methodically and successfully this has been developed. Much which Dr. Mill designed to do is, as yet, unfinished, but this at least may be said, that he has shown how the dry bones of statistics may be vitalized by the exercise of scientific imagination, and has thus brought home to thousands the beauty of natural truths in a manner that few investigators have succeeded in doing.

The war, and possibly even in a greater degree, the general trend of thought, have brought us to the time when a closer co-ordination of scientific work has become essential if the greatest good is to be derived from the efforts of all workers. Dr. Mill's retirement occurs at the moment when unification in the meteorological services of the country, the successful carrying out of which he worked hard

and made great personal sacrifices to further, has been secured. In our last number we published, on the authority of *The Times*, a statement of the formation of the new Meteorological organization which has been brought into being under the directorship of Sir Napier Shaw. In the present number we are glad to be able to supplement this statement with an article by Lt.-Col. E. Gold, one of the most eminent pioneers of modern meteorology, setting out some of the aspirations which now promise to come within the range of practical realization. That the British Rainfall Organization will play its part in the shaping of the new meteorological world we have the fullest confidence. The kindly and willing co-operation of the several thousand voluntary helpers will, we feel certain, be so fully maintained, that the organization cannot fail to prove one of the chief corner-stones of British climatology.

For ourselves, the tradition of Dr. Mill's fine example will never fail to be an incentive to carry on worthily the work which he loved so well.

CARLE SALTER.

UNIFICATION OF THE BRITISH METEOROLOGICAL SERVICES.

By Lt.-Col. Gold, D.S.O., F.R.S.

A famous general of the Flying Corps once remarked that, whatever may have been his opinion about the policy of an Allied Supreme Command, he was fully convinced that a single meteorological service was the correct policy for the Western Front. Full inter-allied meteorological unity was never, indeed, achieved, but there was, in the field, a national unity in favourable contrast with the trinities in Paris and London; and there was the closest co-operation between the French, British and American Military Meteorological Services.

With the end of the war the movement for unity gained power, and now at last the British Isles have one Meteorological Service with an establishment of personnel and equipment more in accordance with the importance of the science than the pre-war establishment; which corresponded rather with the humility induced in its devotees by the study of meteorology.

This unification and expansion means for meteorologists increased opportunities and responsibilities; it does not mean a meteorological millenium in which all difficulties of administration vanish and the secrets of isobaric charts stand revealed. Some of the opportunities will present themselves directly, others will only come as a consequence of diligence and research; and at times the meteorologist may have to abandon the policy of waiting for the

opportunity to force him to take it, and adopt instead the policy of seeking the opportunity in spite of the disappointments which inevitably meet the seeker in the barren lands that border on the fertile gardens of his hope.

The British Rainfall Organization became part of the new service on the 24th July—the one hundred and second anniversary of the birth of Sir Richard Strachey—a day of good omen. How can general meteorology and the study of British rainfall both be advanced by the undoubted advantage of the new situation, and to such an extent as to dissipate the fears of stagnation at Headquarters and of alienation of sympathy in the great army of volunteer Observers? In the first place the great collection of records of rainfall can take its place in British climatology and a new edition of "Rainfall Tables of the British Isles" can be issued with monthly and seasonal maps; perhaps, indeed, with ten-day maps, and with the frequency of rainfall days and rainfall duration adequately treated as well as the distribution between night and day. In the second place the study of orographic distribution of rainfall can be taken a step further, by considering it more closely in relation to other meteorological factors such as wind direction; and both orographically and generally the distribution of rainfall requires discussion in relation to the distribution of pressure and temperature. In this connection the "nœuds" or small areas in which the barometric tendency at times exhibits peculiarities should receive special consideration. Finally an opportunity will present itself shortly for securing either international standards of exposure, measurement and publication, or, such an international series of comparisons as will render the rainfall statistics of different countries intercomparable.

By the amalgamation of the Army, Navy and Air Force Meteorological Services with the parent Meteorological Office, the new Service will be able to combine the teachings of meteorological history with the endeavour to secure simplicity and definiteness in meteorological language, codes and phenomena. But it will also have unparalleled opportunities for developing the three-dimensional study of the atmosphere. Given a knowledge of the isobaric distribution at the surface and the temperature distribution at all heights, the supplementary information derived from observations of the wind at all heights will permit the extent of the differences from steady motion to be computed; and the definition of a "disturbance" may take a new form and new light be thrown on the irregularities in the progress and character of disturbances as we know them at present.

Although there are never observations enough, yet there is always a danger of the meteorologist being swamped by the observations and records which pour in upon him: the danger is an increasing one as also is the tendency to regard observations as things of the

moment, to be thrown away or filed for ever, immediately the forecaster has done with them. If the new Service is successful in dealing with this problem its contribution to our knowledge of climate in and above the British Isles, will be a more enduring monument than the apparently ephemeral achievement of an accurate forecast.

Finally, British meteorology is inseparable from the Ocean: the pressing need for economizing our stores of accumulated energy make it desirable that the meteorology of the ocean should be put on a footing from which it can announce the energy practically available in the winds, the rate at which it can be supplied on any route and the routes on which the maximum per mile can be attained. Warnings of gales, ice and fog do not represent the only way in which the meteorology of the sea can contribute to the national welfare; but the effective use of the existing and increasing statistics of marine meteorology depends on a close liaison between the meteorologist, the shipping company and the sailor. With a "meteorologist in every port," this ought now to be practicable.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

UNUSUAL RAINBOW.

I saw a curious rainbow phenomenon last evening which I have never seen before. It was about 7.30 p.m. (summer time), and clearing after a sharp thunderstorm. A fine rainbow developed, especially bright in its northern limb, with the usual faint repetitions inside the main bow and reversed secondary bow outside. The curious thing was a branch of the main bow. This consisted of an arc of a circle of somewhat larger radius than the main bow, which appeared to spring from it about 5° above the visible horizon, which was itself perhaps 15° above the real horizon. The circle of which this branch was an arc was not concentric with the rest of the scheme, but evidently had its centre 15° to 20° higher, and if complete would have appeared as a horse-shoe arch, such as is seen in Moorish architecture. It, however, faded away above where the spectral band widened out considerably so that it looked like a comet's tail. It was not so bright as the main bow, but brighter than the reversed bow. We could not see the western sky where the sun was sinking into the sea, but my theory is that the effect was caused by the reflection of the sun on the sea acting as a secondary source of light.

J. H. FRYER, M.D., CAPT., R.A.M.C.

51st General Hospital, Etaples, B.E.F., 11th May, 1919.

ABSOLUTE DROUGHT.

An absolute drought prevailed here from July 23rd to August 17th (both dates inclusive) a period of twenty-six days. This has only once been exceeded and then by only one day, viz., in July, 1911. Owing presumably to the north—south, instead of the normal south-west—north-east track of depressions, the west of England enjoyed considerably higher day temperatures in July than did the London district. At Kew the mean maximum is given in your last issue as 65°·0; here in was 68°·7. On July 20th, with a maximum at Kew of 54°, and of only 52°·1 at Dormans Park, Surrey, the reading here was as high as 66°. These are unscreened shade temperatures; in a screen my readings would have been slightly higher still.

R. P. DANSEY.

Kentchurch Rectory, Hereford, August, 1919.

SNOW AFTER FINE WEATHER.

I have worked out the last eight years with the following result :—

	February 15th—March 21st.		
Year.	Warm Days.	Days with Snow following.	Total days with Snow.
1912	23	1	2
1913	13	2	3
1914	12	0	3
1915	10	2	4
1916	4	0	15
1917	2	2	8
1918	19	0	2
1919	3	2	10
Eight years	86	9	47

This shows that snow following warm days is not very marked, especially in warm springs, like 1912 and 1918.

H. NOWELL FFARINGTON.

Leyland Auxiliary Climatological Station, Lancs., 1st September, 1919.

RAINFALL CONTRAST.

Here is another version of the old weather saying, which seems to be a better one than that suggested by A. F. in the August number of your magazine :—

"Never was paid a surer debt,
Than wet to dry—and dry to wet."

T.S.M.

Basset Down, August 21st, 1919.

RAIN DAYS AND SUMMER SHOWERS.

During June we had a number of showers which seemed to be wetting, but measured very little in the rain gauge. On some of these when one would naturally have spoken of a "wet day," the gauge failed to show ·005 in. I have two gauges side by side, a standard "Snowdon" pattern of galvanized iron, and a copper "British Association" pattern with shallow funnel. On two occasions the latter showed a "rain day" when the former did not. I believe the reason to be that the deep funnel of the Snowdon has a larger surface which must be wetted before the water runs down, and from which evaporation can take place. It also has a larger receiving bottle. Possibly the different specific heats of the materials of which the two gauges are made (iron, ·1138, copper, ·0951) may have an effect. This would favour evaporation from the iron gauge. I have little doubt that in winter these showery days would have been "rain days." For other differences between these two gauges I would refer to my letter in this Magazine, vol. **49,** (1914), p. 18. The rim of the Snowdon is 14½ inches above the ground, and that of the British Association gauge, 10 inches.

Swinton, Berwickshire. A. E. SWINTON.

NOTES ON THE CLIMATE OF MESOPOTAMIA.

By C. H. E. Ridpath.

The climate of Mesopotamia is unique, not, of course, for its shade temperatures of 120° and over, but rather it is the long period of such high temperatures in summer and the spells of cold in winter that make the climate noteworthy.

From about May to September the prevailing wind, known as the Shimral, is north-west. This wind is very persistent during the Indian Monsoon, being part of that system. Dust storms and "dust-devils" of a fairly violent nature occur, but, generally speaking, the wind attains a gusty force, 2 to 4, during the day and dies down at night. In the summer the air is intensely dry, relative humidities under 10 per cent. often being registered. The scorching effect of such a wind at 110° or 120° is therefore intense, yet at the same time the very rapid evaporation of perspiration in one's clothes gives a local but very chilling effect. This dry air, however, inevitably and happily results in comparatively cool nights. The highest minimum in Baghdad in the summer of 1918 was 87°·2, but usually it varied from 75° to 80°. In this connection it is interesting to note how one adapts one's standard of temperatures to prevailing conditions. For instance, one would start playing tennis in the "cool" of the late afternoon when the temperature had sunk to 100° or 95°!

If possible, of course, one sleeps in the open, but the amount of sleep will depend on the goodwill of the sandflies, who are ingeniously designed to get through a mosquito net. Fortunately, a light breeze is sufficient considerably to limit their activities.

It is one long blaze of sun the whole summer. Unfortunately, I have no solar temperature readings before me, but they must be in the region of 170° or 180°. Sunrise in the desert is a wonderful time of beautiful, soft colouring and a freshness in violent contrast to the dazzling glare and fierce heat of the day. The temperature rises rapidly : by 8 a.m., for instance, flying is no longer possible, as engines would seize up. Travelling in trains is forbidden after noon. Even at that hour conditions are not very pleasant in vans with corrugated iron roofs. I remember once having to travel over the desert in a Crossley car rather early in the afternoon, about 4.30 p.m. The engine was running quite normally and we were on top speed, yet the water was boiling within twenty minutes.

The temperatures given in the following table are those taken in a standard Stevenson screen on the roof of the British Residency at Baghdad, beside the left bank of the Tigris. The height above ground level would be about 60 feet, so records are possibly on the low side.

The summer of 1917 had been intensely hot. Amongst many high temperatures the absolute maximum was 122°. The following rainy season however, continued until May, 1918, being about six weeks over the usual time. The Arabs predicted a cool summer, and I am reliably informed the summer I am going to describe was a cool one.

							Days with Max. Shade Temp.					
	Mean							90°	100°	110°		Wind
1919.			Abs.	Lowest	Highest	Abs.	Under	to	to	to	Max.	Max.
Month.	Max.	Min.	Max.	Max.	Min.	Min.	90°	99°	109°	120°	Range	Mileage
MAY ...	93·2	68·1	102·9	76·0	73·0	52·5	10	15	6	—	—	321
JUNE...	101·9	75·5	113·6	88·3	85·6	67·6	2	8	14	6	38·3	400
JULY ..	109·2	80·2	117·9	98·4	87·2	71·6	—	1	12	18	39·0	358
AUG. ...	108·0	78·0	116·2	92·3	87·1	70·1	—	3	14	14	37·0	395
*SEPT...	107·1	76·0	113·3	102·7	80·9	72·4	—	—	10	3	35·0	275

							Nights			
1918							Frost	Under 40°		
DEC. ...	59·6	39·3	74·0	50·0	50·0	25·0	5	14		35·0
1919										
JAN. ..	59·7	40·2	70·0	50·0	54·0	33·0	—	16		28·0
FEB. ...	63·0	42·7	71·9	56·3	51·4	35·9	—	7		30·0
MARCH	68·2	48·3	79·9	60·5	56·5	42·8	—	—		26·0
APRIL.	77·2	56·5	86·2	58·3	65·4	50·4	—	—		26·0

* The first 13 days only.

(To be continued).

REVIEW.

Sobre Els Vents Estivals De Convecció à La Costa Catalana. E. Fontseré. Barcelona, 1918. Size, 10½ by 8. Pp. 64. 46 illustrations.

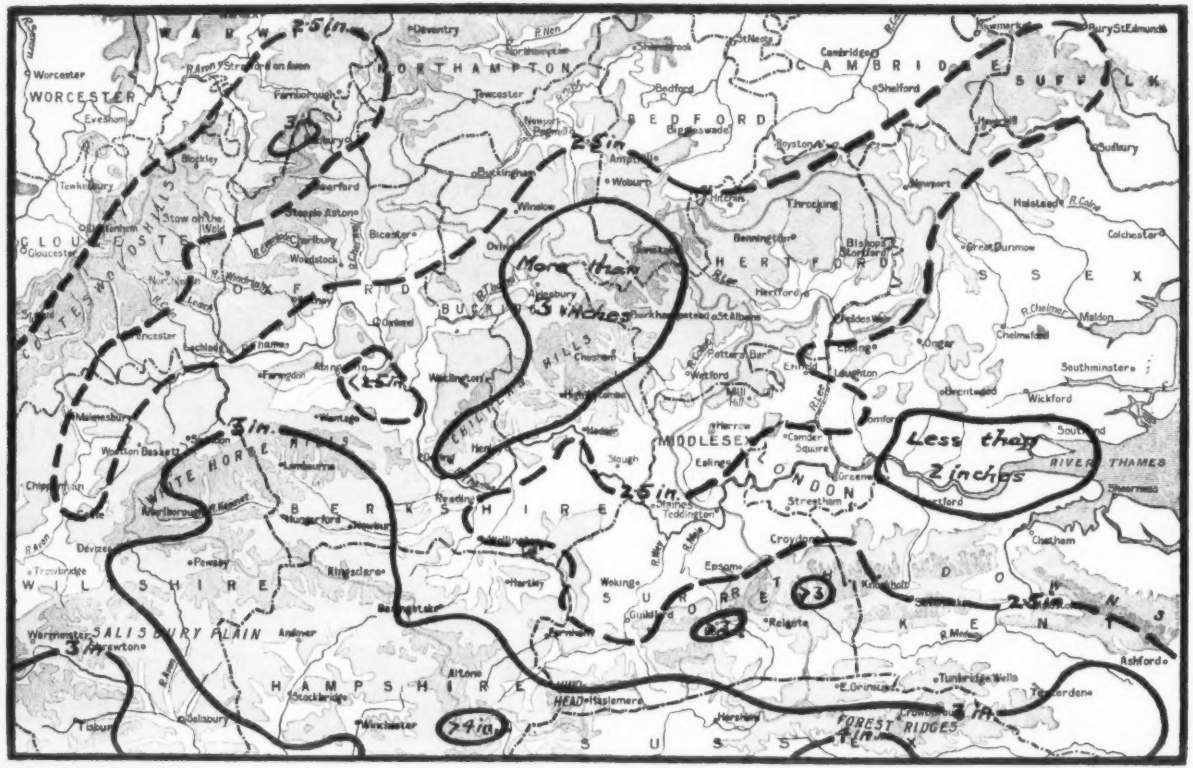
THIS is an important study of the land and sea breezes of Catalana written by the Director of the Aeronautical Station of Barcelona, who is also a Professor of the Faculty of Sciences. Unfortunately the work is written in the local dialect so we cannot pretend to have mastered its contents. The discussion is divided into three sections dealing with observatinos made in Barcelona, supplementary data from the adjacent district, and again in special localities. The services of over thirty volunteer Observers were enlisted, who sent in the data required according to plan. At Barcelona the land breeze sets in during anticyclonic weather after sunset, reaching its maximum velocity at 5 a.m. A complete calm succeeds, but at 8 a.m. the sea-breeze sets in feebly becoming quite marked an hour later and attaining its maximum strength during the hottest hours of the early afternoon. A table is given showing the alternation of land and sea-breezes in 15-day groups, from March to October. The frequency steadily rises from 31 per cent. in the first half of March to 91 per cent. in the last fortnight of July, when it again diminishes, falling to 35 per cent. in the second half of October. A number of maps show the incidence of land and sea breezes at various points and different altitudes along the coast for different hours of the day, with numerous photographic illustrations of clouds of the cumulus type taken at short intervals.

It is to be hoped that this work will be translated into some other languages as an inspection of the illustrations indicates that the results obtained during the investigation are novel and important. It might be possible to make a shot at some of the more striking of these, but it is better not to guess in the present instance, but to await some authorative translation or abstract of the results of what seems to have been a well thought out investigation. R.C.M.

METEOROLOGICAL NEWS AND NOTES.

A CONFERENCE of Meteorologists of the British Dominions will be held in London on September 23rd to 27th. The following have intimated their intention to be present :—Capt. A. J. Bamford, Ceylon; Lt.-Col. D. C. Bates, New Zealand; Mr. H. A. Hunt, Commonwealth of Australia; Mr. H. Knox Shaw, Egypt; Mr. C. Stewart, Union of South Africa; Sir F. Stupart, F.R.S.C., Dominion of Canada; and Dr. G. T. Walker, C.S.I., F.R.S., India. The programme includes visits to the Meteorological Office, the radio-telegraphic stations of the Air Ministry, Kew Observatory, the Meteorological Service of the Admiralty, the British Rainfall Organization and Benson Aerological Observatory.

THAMES VALLEY RAINFALL AUGUST 1919.



WEATHER OF AUGUST.

THE opening days of August were marked by a changeable westerly type of weather, but with a temperature somewhat above the average. On the 2nd the thermometer at many places in the south-east of England rose to between 75° and 80°, and on the night of the 4th, it failed to sink as low as 55°. On the 1st a violent dust storm is reported to have occurred at Catterick, (Yorks).

After the 4th the distribution of pressure became distinctly anticyclonic, and between the 5th and 15th a spell of brilliant summer weather was experienced, the thermometer over a large portion of England rising on several successive days to a maximum of 80° and upwards. The warmest weather occurred between the 9th and 12th, when a number of places recorded shade readings slightly above 85°. During the week ended August 16th between 75 and 80 per cent of the possible duration of bright sunshine was registered at many stations in the east and south-east of England, and as much as 83 per cent. at Worthing. In the London district (as represented by the three stations Westminster, Kew and Bunhill Row), the percentage of sunshine during this brilliant period had been exceeded in only 5 calendar weeks of the previous 38 years, the highest proportion (82 per cent.) occurring in the first week of May in 1909.

After the middle of the month a change to a cool westerly and south-westerly type of weather set in, at first in the north, and afterwards over the country generally. In the southern districts the conditions remained for a time under the partial influence of the anticyclone which was retreating southwards, but in the closing week the weather was everywhere cool and very unsettled, with occasional heavy falls of rain in nearly all districts. Between the 25th and 27th, when the centre of a rather deep cyclonic system moved slowly north-eastwards, across Ireland and Scotland, large amounts of rain were experienced in the far north, and the wind rose to a gale on many parts of our coasts—from S.W. to W. in the south, but from N. and N.E. in the north of Scotland. On the 27th and 28th a well defined secondary depression passed north-eastwards across England, while on the 29th, another small secondary was developed over our southern counties, each disturbance being accompanied by heavy rains over a large portion of England and by thunderstorms in places.

In the Meteorological Office Monthly Fly-sheet, it was remarked, "In August, as in the two preceding months, the rarity of thunderstorms formed a continuing feature in a summer which was characterized in other respects by a large amount of disturbed weather."

The total duration of bright sunshine in August was in most places above the normal, but the excess was nowhere very large.

The total rainfall exceeded the average in the south of England, the west and north of Scotland, and in County Waterford, but the excess was nowhere as much as 50 per cent. of the average. Elsewhere the fall was below the average, the deficiency amounting to 58 per cent. at Braemar. Scattered areas along the east coast and a large area south of the Grampians had a total fall under 2 inches. Practically the rest of Great Britain south of the Moray Firth had from 2 to 4 inches, except the mountain areas. On Dartmoor and in South Wales large areas had more than 5 inches, and this amount fell over nearly the whole of the west of Scotland. Several stations in the Lake District had more than 10 inches and about 15 inches fell on Snowdon, at Loan (W. Inverness) and at Loch More (Sutherland). Rather more than 2 inches fell over the central portion of Ireland, the fall increasing to 4 inches in the west and north and to more than 8 inches in the mountains of Connemara. The general rainfall, expressed as a percentage of the average, was as follows :—England and Wales, 85 ; Scotland, 86 ; Ireland, 81 ; British Isles, 86.

In London (Camden Square) the temperature exceeded 80° in the shade on ten consecutive days, from 6th to 17th. Mean temperature, 64°·6 or 2°·3 above the average. Duration of sunshine, 204·7 hours, and of rain, 37·7 hours. Evaporation, 2·78 inches.

RAINFALL TABLE FOR AUGUST, 1919.

STATION.	COUNTY.	RAINFALL. Aver. 1875–1909. in.	1919. in.	Diff. from Av. in.	Per cent. of Av.	Max. in 24 hours. in.	Max. in 24 hours. Date.	No. of Days
Camden Square	*London*	2·39	2·37	— ·02	99	·75	28	11
Tenterden	*Kent*	2·42	3·52	+1·10	145	·95	28	13
Arundel (Patching)	*Sussex*	2·52	3·59	+1·07	142	·71	27	11
Fordingbridge (Oaklands)	*Hampshire*	2·76	2·90	+ ·14	105	·93	27	11
Oxford (Magdalen College)	*Oxfordshire*	2·44	2·90	+ ·46	119	·62	28	13
Wellingborough	*Northampn*	2·36	2·30	— ·06	97	·90	28	10
Bury St. Edmunds (Westley)	*Suffolk*	2·52	2·50	— ·02	99	·82	28	13
Geldeston [Beccles]	*Norfolk*	2·22	1·61	— ·61	73	·59	28	11
Polapit Tamar [Launceston]	*Devon*	3·17	2·61	— ·56	82	·58	27	13
Rousdon [Lyme Regis]	,,	2·84	4·10	+1·26	144	1·61	27	14
Ross (Birchlea)	*Herefordshr.*	2·90	2·03	— ·87	70	·49	27	14
Church Stretton	*Shropshire*	...	2·65	...	...	·81	19	10
Boston	*Lincoln*	2·39	2·58	+ ·19	108	·71	25	11
Worksop (Hodsock Priory)	*Nottingham*	2·55	2·25	— ·30	88	·81	28	14
Mickleover Manor	*Derbyshire*	2·80	2·04	— ·76	73	·64	27	10
Congleton (Buglawton Vic.)	*Cheshire*	3·52	3·39	— ·13	96	·62	26	17
Southport (Hesketh Park)	*Lancashire*	3·73	3·27	— ·46	88	·83	28	18
Wetherby (Ribston Hall)	*York, W.R.*	2·78	2·11	— ·67	76	·77	28	10
Hull (Pearson Park)	,, *E.R.*	3·05	2·50	— ·55	82	·75	28	15
Newcastle (Town Moor)	*North'land*	3·20	2·38	— ·82	74	·94	28	13
Borrowdale (Seathwaite)	*Cumberland*	11·47	6·95	—4·52	61	...	...	...
Cardiff (Ely)	*Glamorgan*	4·54	2·68	—1·86	59	·98	27	14
Haverfordwest	*Pembroke*	4·21	...	...	...	...	...	...
Aberystwyth (Gogerddan)	*Cardigan*	4·88	4·52	+ ·36	93	·90	25	14
Llandudno	*Carnarvon*	3·16	3·32	+ ·16	105	1·09	28	15
Cargen [Dumfries]	*Kirkcudbrt.*	4·23	3·45	— ·78	82	1·40	25	19
Marchmont House	*Berwick*	3·54	2·55	— ·99	72	·75	25	11
Girvan (Pinmore)	*Ayr*	4·54	3·21	—1·33	71	·60	26	24
Glasgow (Queen's Park)	*Renfrew*	3·62	2·49	—1·13	69	·70	25	15
Islay (Eallabus)	*Argyll*	4·49	4·61	+ ·12	103	·67	21	25
Mull (Quinish)	,,	5·00	6·21	+1·21	124	·87	25	27
Loch Dhu	*Perth*	6·70	3·20	—3·50	48	1·10	25	13
Dundee (Eastern Necropolis)	*Forfar*	3·34	2·44	— ·90	73	1·19	25	15
Braemar	*Aberdeen*	3·63	1·53	—2·10	42	·71	25	12
Aberdeen (Cranford)	,,	3·07	2·73	— ·34	89	1·32	25	16
Gordon Castle	*Moray*	3·29	2·25	—1·04	68	...	...	...
Drumnadrochit	*Inverness*	3.11	1·85	—1·26	59	·38	17	20
Fort William	,,	6·15	5·57	— ·58	91	·95	17	26
Loch Torridon (Bendamph)	*Ross*	6·61	9·10	+2·49	138	1·61	24	24
Dunrobin Castle	*Sutherland*	2·71	...	...	...	...	...	...
Glanmire (Lota Lodge)	*Cork*	3·83	3·27	— ·56	85	·94	18	13
Killarney (District Asylum)	*Kerry*	4·57	3·77	—1·80	61	·50	19	17
Waterford (Brook Lodge)	*Waterford*	3·73	4·41	+ ·68	118	1·34	18	13
Nenagh (Castle Lough)	*Tipperary*	4·04	3·10	— ·94	77	·56	31	21
Ennistymon House	*Clare*	5·01	3·34	—1·67	67	·81	31	17
Gorey (Courtown House)	*Wexford*	3·31	2·91	— ·40	88	·68	25	9
Abbey Leix (Blandsfort)	*Queen's Co.*	3·94	2·29	—1·65	58	·47	31	13
Dublin (Fitz William Square)	*Dublin*	3·08	2·29	— ·79	74	·43	25	16
Mullingar (Belvedere)	*Westmeath*	4·00	1·85	—2·15	46	·37	29	16
Crossmolina (Enniscoe)	*Mayo*	4·68	4·66	— ·02	100	·84	17	20
Cong (The Glebe)	,,	4·70	...	...	...	...	...	...
Collooney (Markree Obsy.)	*Sligo*	4·30	3·87	— ·43	90	·58	31	19
Seaforde	*Down*	3·64	2·98	— ·66	82	·96	25	14
Ballymena (Harryville)	*Antrim*	4·18	3·67	— ·51	88	·70	24	22
Omagh (Edenfel)	*Tyrone*	4·22	4·11	— ·11	97	1·05	24	18

SUPPLEMENTARY RAINFALL, AUGUST, 1919.

Div.	STATION.	Rain inches.	Div.	STATION.	Rain inches.
II.	Sevenoaks, Speldhurst Close.	2·65	XI.	Lligwy	3·03
,,	Ramsgate	1·52	,,	Douglas, Isle of Man	3·63
,,	Hailsham	3·72	XII.	Stoneykirk, Ardwell House...	2·87
,,	Totland Bay, Aston House...	2·95	,,	Carsphairn, Shiel	5·20
,,	Stockbridge, Ashley..	3·15	,,	Langholm, Drove Road	3·98
,,	Grayshott	3·34	XIII.	Selkirk, The Hangingshaw..	2·27
,,	Upton Nervet	2·74	,,	North Berwick Reservoir	2·54
III.	Harrow Weald, Hill House...	2·85	,,	Edinburgh, Royal Observaty.	...
,,	Pitsford, Sedgebrook	2·08	XIV.	Biggar	2·93
,,	Woburn, Milton Bryant	3·03	,,	Maybole, Knockdon Farm ...	3·74
,,	Chatteris, The Priory	1·91	XV.	Shiskine	3·29
IV.	Elsenham, Gaunts End	2·48	,,	Ardgour House	8·67
,,	Rayleigh	1·92	,,	Oban	...
,,	Colchester, Hill Ho., Lexden	2·26	,,	Holy Loch, Ardnadam	4·54
,,	Aylsham, Rippon Hall	2·13	,,	Loch Venachar	3·30
,,	Swaffham	2·58	XVI.	Glenquey	2·60
V.	Bishops Cannings	3·02	,,	Loch Rannoch, Dall	2·20
,,	Weymouth	2·56	,,	Blair Atholl	...
,,	Ashburton, Druid House	4·17	,,	Coupar Angus	2·19
,,	Cullompton	3·49	,,	Montrose, Sunnyside Asylum.	2·17
,,	Lynmouth, Rock House	2·57	XVII.	Balmoral	1·35
,,	Okehampton, Oaklands	...	,,	Fyvie Castle	2·34
,,	Hartland Abbey	2·69	,,	Keith Station	3·03
,,	St. Austell, Trevarna	3·55	XVIII.	Rothiemurchus	...
,,	North Cadbury Rectory	3·57	,,	Loch Quoich, Loan	14·70
VI.	Clifton, Stoke Bishop	2·86	,,	Skye, Dunvegan	6·62
,,	Ledbury, Underdown	2·11	,,	Fortrose	2·07
,,	Shifnal, Hatton Grange	2·17	,,	Glencarron Lodge	7·89
,,	Droitwich	2·02	XIX.	Tongue Manse	7·42
,,	Blockley, Upton Wold	2·78	,,	Melvich	4·47
VII.	Grantham, Saltersford	2·72	,,	Loch More, Achfary	15·83
,,	Louth, Westgate	3·23	XX.	Dunmanway, The Rectory	3·88
,,	Bawtry, Hesley Hall	2·50	,,	Mitchelstown Castle	2·34
,,	Derby, Midland Railway	2·09	,,	Gearahameen	5·40
VIII.	Nantwich, Dorfold Hall	2·78	,,	Darrynane Abbey	3·90
,,	Bolton, Queen's Park	...	,,	Clonmel, Bruce Villa	2·65
,,	Lancaster, Strathspey	3·83	,,	Roscrea, Timoney Park	2·17
IX.	Langsett Moor, Up. Midhope	...	,,	Broadford, Hurdlestown	2·82
,,	West Witton	2·76	XXI.	Enniscorthy, Ballyhyland...	3·25
,,	Scarborough, Scalby	2·83	,,	Rathnew, Clonmannon	2·65
,,	Ingleby Greenhow	3·33	,,	Hacketstown Rectory	3·16
,,	Mickleton	3·30	,,	Ballycumber, Moorock Lodge	2·24
X.	Bellingham, High Green Manor	3·07	,,	Balbriggan, Ardgillan	2·33
,,	Ilderton, Lilburn Cottage	2·03	,,	Castle Forbes Gardens	3·48
,,	Keswick, The Bank	4·27	XXII.	Ballynahinch Castle	5·61
,,	Orton	4·39	,,	Woodlawn	2·92
XI.	Llanfrechfa Grange	3·53	,,	Westport House	4·19
,,	Treherbert, Tyn-y-waun	5·67	,,	Dugort, Slievemore Hotel	...
,,	Carmarthen, The Friary	3·00	XXIII.	Enniskillen, Portora	...
,,	Fishguard, Goodwick Station.	2·46	,,	Dartrey [Cootehill]	2·58
,,	Crickhowell, Tal-y-maes	3·00	,,	Warrenpoint, Manor House	2·45
,,	Birmingham WW., Tyrmynydd	3·96	,,	Belfast, Cave Hill Road	3·96
,,	Lake Vyrnwy	2·72	,,	Glenarm Castle	2·74
,,	Llangynhafal, Plas Drâw	3·64	,,	Londonderry, Creggan Res...	3·79
,,	Rhiwbryfdir	7·77	,,	Milford Manse	3·47
,,	Dolgelly, Bryntirion	4·94	,,	Killybegs	5·17

Climatological Table for the British Empire, March, 1919.

STATIONS. (Those in italics are South of the Equator.)	Absolute. Maximum. Temp.	Date.	Absolute. Minimum. Temp.	Date.	Average. Max.	Min.	Dew Point.	Humidity.	Absolute. Max. in Sun.	Min. on Grass.	Total Rain Depth.	Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
London, CamdenSquare	56·5	2	26·0	23	47·4	34·5	35·9	...	100·0	24·0	3·62	21	6·9
Malta	75·2	9	44·0	20	64·2	52·7	...	83	153·0	44·0	1·56	7	0·4
Lagos	96·0	21	71·4	27	88·7	78·5	77·2	80	157·4	63·0	5·98	7	7·9
Cape Town	90·7	14	52·8	27	82·2	61·1	58·1	66	...	...	·13	1	3·2
Johannesburg	83·8	29	48·5	14	75·3	55·9	52·3	73	...	47·7	3·44	7	4·2
Mauritius	88·5	11	65·2	29	84·7	73·3	71·2	78	...	62·8	7·98	15	6·3
Bloemfontein	91·4	4	48·9	21*	82·9	55·3	52·6	58	..	...	2·60	8	4·9
Calcutta...	102·9	31	60·6	5	94·7	70·0	63·4	58	...	52·3	·51	1	2·2
Madras	94·9	31	66·4	10	88·9	72·0	70·4	74	159·2	69·6	1·96	2	1·3
Colombo, Ceylon ...	93·5	29	68·6	3	89·8	73·5	71·8	77	158·6	62·0	3·36	10	3·2
Hongkong	82·8	25	53·8	31	70·9	63·9	63·9	90	...	...	1·76	11	9·1
Sydney	88·5	20	54·8	22	77·9	63·0	59·5	67	148·3	49·9	5·29	13	4·4
Melbourne	94·2	3	42·0	25	70·6	54·3	51·6	67	146·8	36·9	6·48	15	6·5
Adelaide	94·7	25	48·5	17	77·2	56·8	51·0	54	152·9	35·0	·09	4	4·0
Perth	103·2	9	52·1	27	83·6	63·9	57·0	59	164·2	43·0	·61	3	3·5
Coolgardie	104·8	17	52·8	26	88·9	61·8	51·0	40	165·8	48·5	·91	1	3·4
Brisbane	99·4	5	62·0	16†	85·1	67·8	63·9	67	155·0	57·8	6·02	14	4·6
Hobart, Tasmania ..	83·4	29	37·0	25	66·8	51·6	46·7	61	140·5	29·8	5·86	13	6·8
Wellington	73·8	8	41·9	23	66·8	54·0	50·2	69	138·0	25·6	1·10	6	3·8
Jamaica, Kingston ...	90·3	1	64·9	21	86·7	69·3	67·2	76	...	...	1·95	3	3·5
Grenada	88·0	17	70·0	20	85·0	73·0	...	68	138·0	...	·64	6	2·5
Toronto	56·0	26	7·3	6	42·1	25·5	23·7	74	109·0	4·2	3·19	11	4·7
Fredericton	57·0	26	-8·0	16	39·9	20·2	23·1	71	...	...	3·82	13	5·4
St. John, N.B. ...	54·3	26	4·0	14	39·6	25·7	25·7	72	119·5	3·9	3·21	15	5·9
Victoria, B.C.	62·5	29	32·0	1	50·0	32·0	38·0	80	125·0	23·0	2·22	18	6·9

* and 24. † and 20.

COLOMBO, CEYLON.—Mean temp. 81°·6, or 0°·3 above, dew point 0°·7 below, and R ·78 in. below, averages. Mean hourly velocity of wind 3·6 miles. T88 on 2 days. Prevailing direction of wind W.S.W.

HONGKONG.—Mean temp. 66°·7. Bright sunshine 80·5 hours. Mean hourly velocity of wind 13·5 miles.

Melbourne.—Mean temp. 2°·1 below, and R 4·28 in. below, averages; 3·55 in. of R fell on the 5th, the greatest fall for any one day in 64 years.

Adelaide.—Mean temp. 2°·9 below, and R ·96 in. below, averages; a cool month, only two having been cooler in the past 62 years.

Perth.—R ·12 in. below average.

Coolgardie.—Temp. 3°·9 above, and R ·18 in. above, averages.

Brisbane.—Temp. and R slightly above averages, the drought being finally broken.

Wellington.—Mean temp. 0°·2 above, and R 2·27 in. below, averages. Bright sunshine, 239·2 hours. One sunless day.

Climatological Table for the British Empire, March, 1919.

STATIONS. (Those in italics are South of the Equator.)	Absolute. Maximum. Temp.	Absolute. Maximum. Date.	Absolute. Minimum. Temp.	Absolute. Minimum. Date.	Average. Max.	Average. Min.	Average. Dew Point.	Average. Humidity.	Absolute. Max. in Sun.	Absolute. Min. on Grass.	Total Rain. Depth.	Total Rain. Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
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Johannesburg	83·8	29	48·5	14	75·3	55·9	52·3	73	...	47·7	3·44	7	4·2
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Bloemfontein	91·4	4	48·9	21*	82·9	55·3	52·6	58	..	...	2·60	8	4·9
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Toronto	56 0	26	7·3	6	42·1	25·5	23·7	74	109·0	4·2	3·19	11	4·7
Fredericton	57·0	26	−8·0	16	39·9	20·2	23·1	71	...	...	3·82	13	5·4
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